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The Story of
GAIL BORDEN

THE BIRTH OF AN INDUSTRY

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GAIL BORDEN



By George J. Kienzle

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PARTNERS MEET

THE FINANCIAL PANIC OF 1857 gripped the land. Business after business failed. Money was so scarce that many long-established firms could not raise cash to meet emergencies. Yet Banker Jeremiah Milbank made the most unusual loan of his career. To a man he had known only an hour Milbank advanced money for a new business.

Those dollars started a trend that turned a cross-roads business into one of the world's great industries. But at the beginning everything about the loan seemed wrong. Even the banker's most liberal associates would have told him he was taking a long chance.

Milbank met the man—a tall fellow in his middle fifties—on a train from Connecticut to New York City. For a while they talked of the weather. Then they passed a dairy herd, and the stranger turned the conversation to milk. It was a popular subject. Much of the milk being sold in New York was produced in the city; cows were kept in unsanitary barns and fed mash from liquor distilleries.

The practice was condemned by many people who believed that

milk produced under such conditions was poor. The dairymen involved claimed the milk was as good as that from farms. Most people would have preferred fresh country milk; but there was not enough of it available, and many families had to buy from the distillery dairies. As they talked of these problems, the stranger asked:

"What would you say if I told you I had found a way to make milk safe and keep it sweet a long, long time?"

"I'd say you had a discovery of great value."

"I do have such a process! I've spent years developing it; now it is perfect. I preserve milk by condensing it. It is sweet and clean and safe and richer than the richest fresh milk you can imagine!"

Such an invention was worth a fortune. Banker Milbank looked carefully at the man who had come into the railroad car and sat down beside him only a few minutes earlier. There was little in the stranger's physical appearance to inspire confidence. His hair and short beard were white. His face was lined with worry. His shoulders were stooped. He was so slender that despite his unusual height he seemed frail, almost sickly. He was high-strung, nervous. His coat was worn, more worn than most. And he admitted that he was worse than penniless. He had put all his cash into the invention. He had mortgaged his property, borrowed from his friends. Then the panic had come just as he started producing condensed milk. Now he was deeply in debt, being sued.

Few men asking for a loan would have given themselves such a poor recommendation; yet this was the thing that impressed Milbank most. He was struck by the man's sincerity, his enthusiasm, his knowledge of milk, his faith in eventual success. When the stranger asked for a loan, the banker decided to take a chance—even if it

was a long one. He agreed to lend the man the money to pay his debts and get his condensed milk business going again.

This is the story of the stranger Milbank met during that short train ride. The story of Gail Borden, who founded a great industry and helped establish a state and a nation.



One of Gail Borden's earliest memories was of his mother sitting beside the fireplace in her high-backed rocker reading from the family Bible. The Bible was her proudest possession. It had belonged to her great-grandfather, Roger Williams, who established Rhode Island and founded the Baptist Church in America. In this Bible she had carefully recorded her son's name a few hours after he was born:

"Gail Borden, son of Gail Borden and Philadelphia Wheeler Borden, November 9, 1801. Norwich, New York."

Gail's father was a thrifty Yankee farmer who managed, even when crops were poor, to eke out enough grain to carry his family

through the bitter winters. But he dreamed of more fertile soil, where crops never failed and the land always paid a man a fair return for his labor. From across the Alleghanies came stories of just such land. So in 1815 Gail's father piled his household goods, his tools, his wife and four boys into a wagon and struggled up the tortuous trail across the mountains. Finally they came to the Ohio River. There they loaded their belongings on a barge and set out in search of their future home.

Days later they nosed their flatboat ashore in northern Kentucky. The family needed grain to carry them through the next winter; so father Borden decided to plant and harvest a crop before moving on. He leased land on what is now part of Covington, and Gail helped him cultivate corn where the city hall stands today. But Gail did not limit his activities to farming. He was 14, ambitious, imaginative. He was unusually good at arithmetic and this opened a new field to him—surveying. He soon became so expert that he was asked to help lay out the City of Covington.

The next spring the Bordens headed west again. They traveled down the Ohio until they came to a spot where the river turned sharply to the south. There, in what was to become Jefferson County, Indiana, they cleared the land and settled down to the difficult job of wresting a living from the soil.

By his twentieth birthday Gail had taken a responsible place in the life of the settlement. He had finished school and taught for two years. Tall and big-boned, he had piercing blue eyes, a firm mouth and a well-shaped nose. His quiet self-assurance inspired confidence. He was enthusiastic. The community respected his judgment. The men saw in him a natural leader and selected him as captain of a

company of Hoosier militia. But Gail needed a greater outlet than the little pioneer community offered. Besides, he felt that a change of climate would help him overcome an irritating cough he had developed during severe winters. He decided to go south.

Men were needed to handle flatboats loaded with supplies for settlers along the river and skins and other goods to be traded at New Orleans. Gail and his brother Tom, who was 18, obtained jobs manning one of these. They were to sell the craft and its cargo upon arrival at the great port at the mouth of the Mississippi.

When the Borden boys reached New Orleans late in the summer of 1822 the city was buzzing with the most exciting news in years. Texas—the fabulous land to the west—was being opened to Americans for the first time. For years Texas was forbidden to all but its Spanish rulers, Mexicans and Indians. Yankees who ventured within its boundaries and were caught were put to death for trespassing, tossed into dungeons or sentenced to hard labor. Some escaped. They brought back stories of rich prairie land that stretched beyond the horizon. They told of vast herds of wild horses and buffalo.

For days the Borden boys heard talk of Texas. Stephen F. Austin, who was to become the founder of Texas, was in New Orleans. The Mexican government had granted him permission to bring 300 families into the territory, and he was in the city to talk to anyone who wanted to join him. Dozens clamored for his attention, but Gail and Tom managed to reach him.

After the meeting with Austin, Tom decided to go to Texas. Gail was as eager to see this new country as his brother, but he knew he must wait. His health had to come first. While he was debating where to go, he met Dr. William Lattimore, who owned a fine

plantation in Amite County, Mississippi. The physician urged Gail to go to Mississippi with him.

"The climate there is ideal," he said. "Your health will be restored in a few months." Gail thought it over. He accepted the invitation and then told Tom:

"You go home and give the people who owned the flatboat the money we got for our cargo. Then come back and join the Austin expedition. You'll have plenty of time; he won't leave for weeks."

So Tom returned to Indiana before going to Texas with Austin's famed original 300 families. Gail spent six years in Mississippi regaining his health. He soon found his place in Amite County. He surveyed in the summer and taught school in the winter. One of his pupils was Penelope Mercer, the beautiful daughter of Colonel Eli Mercer. Gail fell in love with her. They were married September 28, 1828. Gail was nearly 27, his bride 16.

Gail was highly regarded in Mississippi and his parents were well established in the Ohio River country. But Tom kept writing letters filled with such glowing reports of Texas that they finally could resist the lure of that country no longer. In 1829 young Gail, his wife, her five brothers and sisters and her parents started for Texas. At about the same time the elder Gail Borden set out down the Ohio. With him were his wife, a young daughter and two sons: Paschal, who was 23, and John, then 17. At Memphis Gail's mother and sister died. The saddened father and brothers continued on to New Orleans. There they met Gail and Penelope and the whole group traveled to Texas on a schooner. They reached Galveston in December 1829. The day after they arrived Gail and Penelope's first child was born. They named her Mary.

Gail was granted a Spanish league (4428 acres) of land along the Colorado River. He began farming and raising cattle, but Stephen Austin soon asked his help in mapping and laying out the territory. Austin, the leader of the little band of Texas settlers, had set up headquarters in San Felipe. Gail went there, too, and took his place beside Tom as one of the leaders of the community. Gail Borden came to Texas to farm, but the next 15 years plunged him into high adventure in war, journalism and science.



WAR

THE FIRST DECADE AFTER TEXAS was opened to Americans there was little question in the minds of the settlers about where their allegiance belonged. They were grateful to Mexico for generous grants of land—some 20 million acres. They lived in peace for 10 years, but trouble broke out in 1832. A garrison recruited from Mexican jails and commanded by a swaggering fugitive from justice was sent to collect taxes. The soldiers became abusive and made exorbitant demands. A group of Texans who long had resented Mexican rule welcomed a chance to drive them out.

Austin, the Bordens and other leaders were opposed to rebellion. They called a convention at San Felipe and assured the Mexican government of Texas' loyalty. They did, however, petition for greater freedom in local government. Gail Borden attended the convention. The next year a second convention was held, and it was there Gail met Sam Houston, who was to become Texas' great military leader and first president. Gail also helped write the first of Texas' seven constitutions. The convention chose Austin to go to Mexico City to

petition for statehood and seek approval of the constitution.

Austin placed the affairs of his land office in Gail's hands. He set out confidently. His last words as he rode down the trail were:

"For God's sake don't let my people do anything foolish or rash while I'm away."

Austin found Mexico City torn by revolution. In 1822, Santa Anna, a young Vera Cruz lieutenant, had started a revolt. It doomed Emperor Iturbide; his government fell. A republic was set up; but Santa Anna had no taste for peace, no desire for freedom for his countrymen. He had fought under the banner of democracy only to gain popularity. He had tasted a little power and liked its flavor. He dreamed of the day when he alone would rule Mexico and all her possessions. He was too shrewd to buck the tide of freedom openly. He waited; he plotted; he stirred up one revolt after another. Finally his chance came. In 1832 he overthrew the president.

Shortly after arriving in Mexico City, Austin realized he was dealing with a man who talked democracy and worked for dictatorship. He was not even given a hearing.

He was thrown into a dungeon, and there he was kept prisoner for nearly two years. Finally he was freed and allowed to return home. He reached Texas in September 1835. He told the colonists they must fight or submit to a dictator.

The call to arms came. Gail and his brothers were among the first to answer. Mexican troops were marching on San Antonio. They were commanded by General Cos, Santa Anna's brother-in-law. He had orders to arrest Texans charged with treason and take them to Mexico for trial. Texas met the challenge. Austin led 300 volunteers against the invaders. Tom, Paschal, John fought at his side; Gail

was left behind in San Felipe. Gail had to handle Austin's affairs. More important, he was needed there to publish a newspaper that would rally support to the cause.

Gail worked day and night. He questioned every traveler from San Antonio; he collected every scrap of information about the movements of enemy troops. The first issue of his newspaper—the *Telegraph and Texas Land Register*—came off the press October 10, 1835. It told its readers:

"War is our only recourse. There is no other remedy but to defend our rights, ourselves and our country by force of arms."

Gail wrote the history of Texas as it was being made. In the *Telegraph* he told of the courage of Austin's undisciplined, nondescript fighters. They had no uniforms, no training; they were badly outnumbered; they fought by instinct. But they met and captured General Cos and his soldiers.

Gail told of this great victory. He reported the selection of hard-riding, hard-fighting Sam Houston as commander-in-chief of the armies of Texas. He warned that Santa Anna himself was marching on Texas with a large force. He told the tragic story of the Alamo, a Franciscan mission near San Antonio. There a handful of Texans held off Santa Anna's thousands for three weeks; then on March 6, 1836, they were massacred. He printed Texas' declaration of independence, issued March 2, 1836. He headlined the battle cry of the new republic: "Remember the Alamo."

Worse news came, but Gail preached hope, determination. Three forces stood between Texas and defeat—two small bands in the southwest and 300 men under Sam Houston. One of the units in the southwest was wiped out; the Mexicans promised to treat the other

fairly if it would give up. The Texans surrendered, and firing squads mowed down all but a few on Palm Sunday, March 27. Houston dared not stand and fight. He retreated slowly toward the Colorado, picking up recruits along the way.

Texas seemed lost. Gail Borden refused to admit it. Fast riders stuffed their buckskin jackets with copies of the *Telegraph;* they carried the news throughout the land. The courage of Texas was on every tongue. Sympathy grew; support came; recruits poured in, mostly from the U.S.A. The tide of defeat swept on. Houston retreated through San Felipe, Santa Anna at his heels. Civilians fled in panic. Gail sent his family to Galveston. He stayed with his press; he printed a final issue of the *Telegraph* in San Felipe as the town went up in flames then escaped to Harrisburg with his equipment.

The need for a newspaper to rally men who loved freedom was never more urgent. Santa Anna was moving on Harrisburg. Gail set up shop. He went to work on an issue dated April 14, 1836. It never came off the press, but journalists are proud of the opening words of that unfinished issue:

"We promise the public of our beloved country that our press will never cease its operation until our silence shall announce to them that there is no more in Texas a resting place for a free press nor for a government of the people."

Gail and his printer worked until Santa Anna neared the outskirts of Harrisburg. Gail escaped to Galveston. The Mexicans burned his print shop and threw his press into the river. Texas seemed doomed. Then a chance came.

Houston was a cagey fighter. He had lived for years with the Cherokees; he knew all of their tricks. He kept retreating, luring

the Mexicans farther from home. Then word came that Santa Anna had entered Harrisburg with only 500 foot soldiers and 50 horsemen. The Mexican general was so sure of victory he had left the main body of his troops on the other side of the Brazos River. Houston smelled victory; he closed in for the kill.

On April 21, the two armies met along the Brazos River below Harrisburg. Houston had 1000 men. Reinforcements had swelled Santa Anna's forces to 1200. The Texans formed a battle line. They charged. In a quarter of an hour victory was theirs. Santa Anna was captured the next day. Texas was saved.



TWO SECRETS

GAIL BORDEN'S NEIGHBORS didn't say he acted strangely. You didn't say that about a man like Gail Borden; even if he did do things that were . . . well . . . a little unusual, to say the least.

It all started a few years after he moved to Galveston. He came there right after the war, to be collector of the Port of Galveston. President Sam Houston picked him for the job. He couldn't have made a better choice. Gail Borden was just what this growing little town needed. He saw to it that taxes were collected. He and Penelope were popular with the people of Galveston. But Gail's pay was poor. He had barely enough money to give his family the things they needed, and he was glad after a little more than a year to take another job. He became secretary and general agent for the Galveston City Company. This corporation owned the land Galveston was located on; it was developing the city. This job gave him time to work out ideas that had been in his mind for years.

It was when he started to experiment with these ideas that the

neighbors began to wonder. There *were* some odd things going on. Gail carried lumber and wagon wheels and large pieces of canvas into his barn. Night after night for months the neighbors heard him working and hammering there. Other evenings a great rattling of kettles came from the fig orchard behind his house.

He couldn't hide his activities long. He had six children, and he knew you couldn't keep youngsters from talking. One evening the minister came to dinner and Gail invited him into the orchard. He led his friend to a huge iron kettle over an outdoor fireplace.

"What are you cooking?" the preacher asked.

"I'm condensing figs; I've a theory you can preserve food by condensing it. I put in water, half a hogshead of sugar and a cartload of figs. I heat the mixture and when it has cooked long enough I press it and preserve it in 10-pound containers."

Gail took the minister to a small building nearby and showed him row upon row of cans and cases.

"They're filled with condensed fruit, beef, chicken and turkey," he said. "I've also condensed many other foods. I believe the process has great value."

One midsummer evening a short time later the Bordens gave a dinner party. The guests were chosen carefully: Mayor John M. Allen, the editor of the local newspaper, the minister, a wealthy planter and his two daughters, and a few others.

Gail served his guests the most unusual dinner they had ever eaten. It was an odd menu: concentrated soups, condensed foods, fruits and extracts. Gail ate heartily and talked of the wonderful flavors he had captured in these dishes. His guests nodded politely.

After dinner he took the party into the garden. He told them

they were about to experience the greatest thrill of their lives. They expected some kind of machine for preserving food. Instead, he threw open the barn doors and showed them the strangest contraption they had ever seen. It had wheels, yet it wasn't a wagon; it had a sail, but it wasn't a boat. There were benches for passengers and a seat up front for the man at the controls.

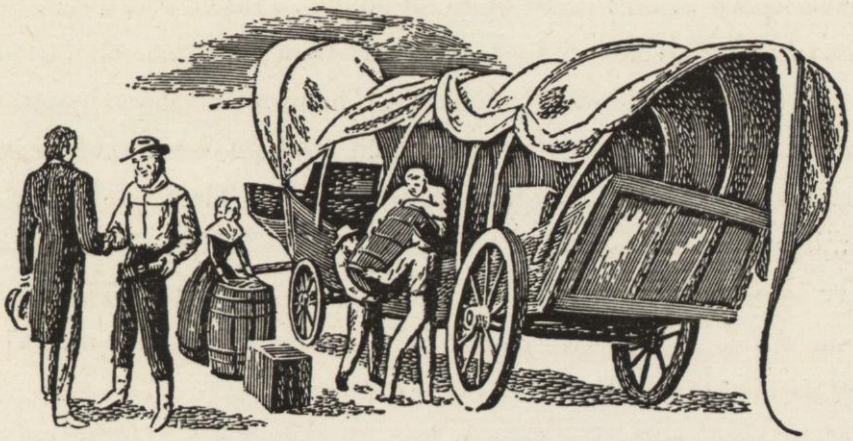
A team of horses pulled the vehicle across a field onto the smooth beach along Galveston Bay. The horses were unhitched and Gail explained his invention. It was a land schooner. It applied on land the principles used by sailors on the sea. It harnessed the wind. His guests were afraid of the thing. They didn't want to ride in it; but Gail assured them it was as safe as their own wagons. They piled in.

Gail raised the sail. The schooner moved down the beach. It gained speed . . . 5 . . . 10 miles an hour . . . faster and faster. The passengers yelled for him to stop. The women screamed. Gail tried to slow the schooner down. He couldn't. The women became hysterical; they screamed louder; the men tried to help Gail. He became excited. He swung the rudder the wrong way. They headed for the sea. He pulled at the controls. The wind blew harder. The schooner dove into the waves. Gail was thrown into the water. The vehicle plunged on. A big wave caught it. It rolled slowly over on its side and skidded to a stop.

The men pulled the women from the wreckage. The water was shallow. No one was hurt; everyone was frightened. The guests trudged back to his house, the women holding their soaked skirts above their ankles, the men sloshing along with water in their boots. Gail ran from one to the other, assuring them it was an accident, begging their forgiveness. The night was warm. All were young, or

adventurous or both. By the time they reached home everyone was laughing: at each other, at their host and his weird contraption. The land schooner was a failure. Gail was the first to admit it, but he turned his inventiveness into other channels.

Those early years in Galveston were perhaps the happiest in Gail Borden's life. But it couldn't last. In 1844 yellow fever swept the city. Gail kept his family at home, but he went out each day to help nurse the dying and bury the dead. Then the fever struck the Borden household. Their four-year-old son died in March, Penelope in September. Gail helped dig their graves in the garden. Penelope was only 32. Two years later he lost another son. Gail was different after that. He stayed to himself; he turned more and more to his work.



Gold had been discovered in California. The rush was on. Many died along the way. Still they kept going. A party leaving Galveston asked Gail to help them prepare for the journey. He promised to make them a meat extract they could use along the trail. The idea

wasn't new. The Indians had a concentrated meat. They called it pemmican; they made it by cutting buffalo meat or venison into strips. Then they dried the meat in the sun, pounded it fine, mixed it with melted fat and packed it in hide bags. Pemmican kept fairly well, but it had a bad flavor.

Gail wanted a tasty meat extract. He boiled 120 pounds of beef down to 10 pounds. It was thick as molasses and smelled a little like glue. Then came the idea that turned failure into success. He mixed flour with some of the extract, kneaded it into a biscuit, baked it and left it overnight to cool. The next morning he had a meat biscuit rich in flavor and food value. The gold seekers bought 600 pounds, enough to keep them strong and healthy when they crossed the desert on their way to California.

Dr. Elisha Kent Kane, the Arctic explorer, used Borden's product. Kane and the members of his expedition were forced to abandon ship, and it was their chief food on a 10-week trek across northern wastes. Dr. Ashbel Smith, former surgeon general of the army of the Republic of Texas, wrote the president of the American Association for the Advancement of Science:

"I believe there does not exist in nature or art the same amount of nutriment in as small bulk or weight, and as well adapted to support, efficiently and permanently, mental and physical vigor as is concentrated in the meat biscuit."

Gail and his brother Tom built a meat biscuit plant in Galveston. A magazine writer told how careful Gail was about the purity and quality of his product.

"Everything about the establishment is neat and clean in the highest degree," the article said. "In fact, fastidious cleanliness seems

to rank with the proprietor as the first of virtues." The article added that only the finest meat and flour were used.

Gail felt there would be a big demand among city people for his meat biscuit. He considered it ideal for soups, broths and gravies. He thought it perfect for hospitals, where foods with small bulk and good nutritional qualities were considered important. He believed the product ideal for men who had to travel long distances: soldiers, sailors, explorers, travelers. He was elated when Colonel E. V. Sumner of Fort Leavenworth wrote the War Department in Washington:

"I have tried the meat biscuit and find it all and more than the inventor thinks it is. I lived upon it entirely for several days and I am convinced that I can live upon it for months and retain my health and strength. I am decidedly of the opinion that we ought to commence using it in the army at once; and I believe for all active operations in the field the advantages of this food will be so apparent that it will come into general use in a few years."

Then came even more acclaim. Gail personally exhibited his meat biscuit at the International Exhibition of 1851 in London. His was the only American food given a prize. The meat biscuit won the Great Council Medal of the Exhibition. Its inventor was elected an honorary member of the London Society of Arts.

Gail could see nothing but limitless possibilities for his product. He returned from London in high spirits. He expected almost overnight success. He contacted the steamship lines. A few bought small supplies. To increase sales he went into the galleys of tramp schooners; he cooked meals centered around the meat biscuit. The ships' cooks were indifferent. He tried the hospitals; he cooked more meals. The young doctors laughed at him. He spent months in

Washington trying to sell the army and navy. They refused to give his meat biscuit a trial.

During this period Gail was in New York City and Washington most of the time. Friends and relatives cared for his children. For more than five years he lived from hand to mouth, but he refused to quit. He wrote a friend in Texas:

"Don't infer I have given up, for I know that the meat biscuit is one of the discoveries of the age. . . . But the rub is, my debts are due. . . . Every piece of property I have is mortgaged. I labor 15 hours a day—day-in and day-out."



A GREAT DISCOVERY

DURING THE FIVE YEARS AFTER he returned from London the meat biscuit took most of Gail's time and energy. Yet he began another venture; he started searching for a practical way to preserve milk. He had condensed milk in his fig orchard at Galveston; but the process was crude, the product poor.

He again became interested in condensing milk because of a tragedy on the ship that brought him from England in 1851. Two cows carried on board to provide milk for children became sick. Babies fed milk from these cows grew ill. Some of them died.

The picture of the heart-broken mothers holding their dying infants in their arms stayed with Gail. In New York, Washington and other cities he saw the scene repeated. Much of the fresh milk sold was unsafe. People who used it often became sick; some died. Besides, milk usually soured in a few hours. Gail kept turning the problem over in his mind. In 1852 he went to work. Some details of his experiments are not known, but this is the general picture:

He had preserved meat by condensing it. Why wouldn't the same

process keep milk from souring, Gail asked himself. He put a gallon in a kettle and boiled off the water until less than a quart was left. He let it cool then tasted it. The flavor was terrible. Burnt! That complicated things. Obviously, ordinary condensing methods wouldn't do. No one would buy milk that tasted burned. But it did seem to stay sweet a little longer than fresh milk. Was there a way to solve the condensing and flavor problems at the same time?

Gail went over the process step-by-step. He studied every phase of the problem. Condensing alone had not been the answer in the case of meat. Flour was the magic compound. Meat by itself, even when concentrated, soon spoiled. Mixed with flour and made into the meat biscuit it kept indefinitely. But Gail didn't want to add anything to milk. He wanted milk that could be restored to its original flavor and condition merely by adding water; he wanted milk every mother could use safely.

He tried again. Fresh milk itself seemed pure. Then what made it sour? Was something getting into it? Was it happening while the milk was being condensed? Was air the thing that was causing the trouble? There was a way to find out.

At New Lebanon, New York, lived a colony of Shakers, a religious sect. Gail had become acquainted with them during a trip through the upper part of the state. He knew they used a vacuum pan when they condensed sugar, fruit juices and extracts. It kept out the air; it permitted them to evaporate with less heat; it prevented burning and discoloration. Gail wanted the pan for a double purpose—to prevent burning and to see if eliminating air during evaporation would keep milk sweet longer. He went to New Lebanon. The Shakers gladly lent him their equipment.

For months he worked: testing, retesting, checking, rechecking. One day in the spring of 1853 he found a formula that seemed to promise success. He evaporated milk in a vacuum pan; no air could get to it. He kept it boiling until only one-fifth of the milk was left. When it was cool he tasted it. No burned tinge! A rich flavor, like good cream. But would it keep? He waited anxiously. One day . . . two . . . and a third day before it began to sour. It looked like success! He had to be sure. He tried again. The results were the same. Finally he had no doubt. Milk evaporated in vacuum tasted better, kept longer. Elated, Gail hurried to Washington to file his patent claims.

"I am aware," he said in his patent application, "that sugar and various extracts have been and are now concentrated in vacuo under a low degree of heat to prevent discoloration or burning. I do not claim concentrating of milk in a vacuum pan for such purpose alone, my object being to exclude the air from the beginning of the process to the end to prevent incipient decomposition. This is important and I claim the discovery."

The commissioner of patents had other ideas. He said Gail must show his process was both new and useful before he could be granted a patent; and the commissioner felt that the inventor had failed to prove either. He pointed out that an Englishman named Grimwade had been given a patent on a process similar to Gail's, and another inventor had a patent for condensing milk by "any known mode."

Gail was astounded. He had never heard of Grimwade, or the other inventor, or the patent office regulations, for that matter. All this meant trouble; he had more than enough already. He had been promoting the meat biscuit three years and had only succeeded in going deeper into debt. Proving his right to a milk condensing patent

would cost money and take time. He had no funds, but the milk condensing process had so much potential value he couldn't give it up; he had to go ahead.

Gail asked a London patent attorney to work on the problem involving the English inventors. It took many, many months but he proved that Borden's process was new. The other inventors had never carried their developments beyond the idea stage, and no one had ever used the vacuum pan to preserve the purity of milk. The commissioner finally admitted that Gail's process was different; but he still didn't think it was useful. He said so.

"Borden claims evaporation in vacuo to be the valuable feature of his discovery and necessary," the commissioner commented. "The commissioner sees no reason to believe this. . . . If it were really a discovery Borden would be entitled to a patent, but I see nothing from which I can conclude that this exclusion of air is important. If it were shown to me that milk taken fresh from the cow and evaporated in the open air would not answer substantially the same purpose as when evaporated in vacuo, I would certainly grant Borden the patent he asks; but until this is done, I do not feel justified in allowing it."

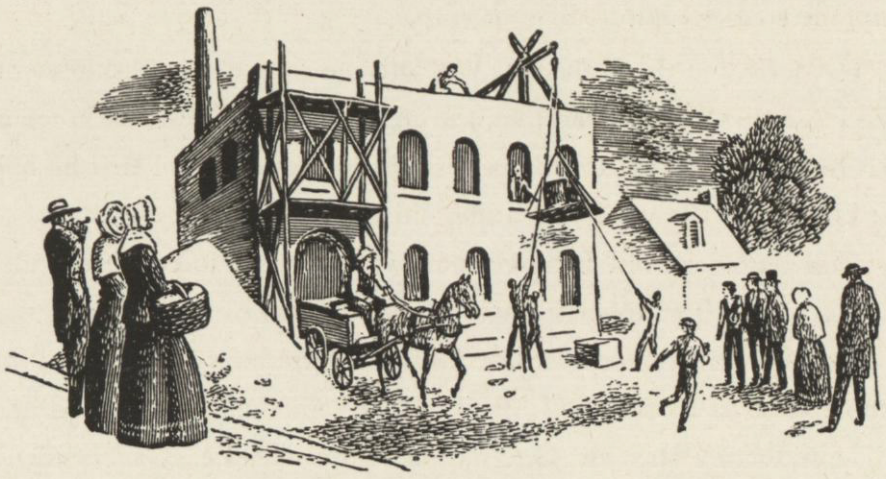
This blunt rejection was staggering. Gail had poured his energy into the meat biscuit. As the years passed, and it failed to succeed, he had, without realizing it, transferred his hopes to condensed milk. Nothing, however, could dampen his spirits for long. In September, 1855, he wrote a friend:

"You ask what I am going to do? First, I am going to stick to the meat biscuit as long as I can make any sales. Second, I am still making progress in my invention of concentrating milk. I am happy to inform you that I have succeeded in concentrating milk 80%,

without the use of sugar. It is soluble in either hot or cold water.

"It is a beautiful article. I do not hesitate to tell you that should I live two years I shall present the world an invention of vast import. Milk will be as common on shipboard as sugar. Remember what I say. I will be recognized as the inventor of this great process."

Two friends, both distinguished scientists, tried to help him prove his right to a patent. One was Robert McFarlane, discoverer of dyeing processes and editor of the *Scientific American;* the other was John H. Currie, head of an important laboratory. They offered to test Gail's claims. They checked every known process for condensing milk; and they concluded that use of the vacuum pan to keep out air during evaporation not only was new but also important. Gail got his patent! It was issued August 19, 1856. The three-year fight with the patent office was over.



In Washington Gail had met a lawyer named Thomas Green. Green was wealthy. He owned an estate nearby and considerable

property in Virginia and Texas. He invited the inventor to stay with him. In return for this hospitality Gail advised Green concerning the management of property the lawyer owned in Texas; he also made suggestions about the surveying and plotting of land Green held in Virginia. Green and a man named James Bridges prepared the legal papers Gail needed in his patent battle. They were sure the milk condensing process was worth a fortune, and they offered to supply money for a factory. In return they asked five-eighths interest in his patent. Gail had no other way to get money; he accepted their terms.

Gail lost no time getting started. His debts worried him; he wanted to get them paid. He selected Wolcottville (later named Torrington) on the Naugatuck River in Connecticut as the place to build his milk plant. It was a tiny village in the center of a rich farming area. The farmers could supply all the milk he needed, and the town was close enough to New York City to keep the cost of shipping condensed milk to market low.

His arrival in the Village of Wolcottville caused great excitement. In a few hours word spread that a stranger from the West was in town, that he was preparing to start a desirable enterprise, and that he had the blessing of the village's leading citizen—Darius Miner.

Gail rented an old carriage factory and began to convert it into a milk plant. The town turned out every day to see how work was progressing. His factory became almost a community enterprise; the people were as anxious as Gail to see the remodeling completed and milk production started. One day black news came. Gail Borden's backers—Green and Bridges—decided to risk no more money. Gail was penniless; bills were due. A friend lent him $100. He went to New York. Without money he couldn't stay there either. He returned

to Galveston, where he had a house. His children were there; at least he could be with them.

He was in Texas eight months. He never gave up hope. Then a letter came from Green. He told Gail he had made a partial settlement with Bridges and now was ready to advance more money for the condensing plant.


FANCY GOODS
SON
NEW YORK
CONDENSED
MILK
COMPANY

TWO WIN SUCCESS

THIS TIME GAIL AND GREEN made their plans with even greater care than before. They decided the old carriage factory wasn't adequate, but Gail wanted to stay in the vicinity of Wolcottville. They scoured the countryside for a suitable location and found an abandoned mill at Burrville, Connecticut, five miles up the Naugatuck Valley from Wolcottville. It was set high on a hill beside a waterfall that turned the mill wheel.

Gail began making alterations on the building and installing equipment. He founded his company May 11, 1857, and turned out some condensed milk. But before he could begin volume production a financial panic swept across the country, smashing business after business. Gail refused to quit until he had tried everything. A maker of mill machinery later told how Gail asked him for help:

"My name is Gail Borden. I have discovered a way to keep milk sweet for a very long time and have tried the process by hand labor. But, while assured of its utility, I find that to make it pay I must have some mechanical power. In getting thus far, I have spent all

my money. My friends, doubting my ultimate success, will not lend me any. I have come to ask you to sell me the water wheel I require and wait a reasonable length of time for your money." The wheel-maker then tells of his reaction:

"It was a strange proposal for one so poor even to consider, for it meant tying up over one-third of my capital for some time. But I had been much impressed by the frankness of his face and speech. I had almost decided in the affirmative when my wife, an excellent judge of character, gave her verdict in his favor. I agreed to his proposal. If my memory is not at fault, there was no note or other evidence of indebtedness given or required. Mr. Borden was a man who carried his letter of credit in his face. During the two or three hours he remained with us, he told us much of his personal history and revealed to us almost unconsciously many of the traits of his admirable character. It was with great pleasure that we heard from time to time of his success. He later paid the bill with interest, adding many expressions of thanks."

But Gail needed more than a water wheel. He needed money, and there just wasn't any to be had. Creditors sued him; the situation seemed hopeless. This was the state of his affairs when he boarded the train for New York and sat down beside Jeremiah Milbank. The banker made a settlement with Gail's creditors. He gave Gail money to start again. By February, 1858, the Burrville plant was operating under the name of the New York Condensed Milk Company.

The Borden-Milbank partnership was a perfect combination. Gail had the technical knowledge to develop and produce high quality condensed milk; Milbank had the business skill needed to make the new product a success. Progress was slow. Tastes change gradually,

and it was some time before people learned to like the flavor of this new milk. The first samples were carried from house to house. Then Borden's condensed milk was ladled out from 40-quart cans pushed through the streets of New York City on a hand-cart. Later Gail canned his milk. In cans it kept indefinitely and could be shipped to any part of the world.

In the spring and summer of 1858 Frank Leslie, publisher of *Leslie's Illustrated Weekly,* began his campaign against New York City dairies that fed cows swill from distillery vats. Some animals were milked even after they became diseased. The death rate among infants rose sharply. Leslie's campaign created great interest in the cleanliness of milk. It increased Borden's sales; his condensed milk soon became known as a quality product. The May 22, 1858, issue of *Leslie's Weekly* reported that a committee of the New York City Academy of Medicine praised the purity of Borden's milk. It added:

"One quart, by adding water, makes two and a half quarts of cream, five quarts of rich milk and seven quarts of good milk."

Gail Borden never heard of germs; he was condensing milk long before Louis Pasteur startled the scientific world with his discovery of microbes. Gail didn't know that heating killed any harmful bacteria in the milk. Neither did the people who bought the new product; but they soon learned that, while babies and grownups sometimes became sick and died after drinking fresh milk, Borden's condensed milk was always safe.

Gail found, too, that milk supplied by the most careful dairy farmers kept better. He learned that condensing it and selling it under the cleanest possible conditions improved the product. Many people thought he was too fussy about sanitation. He knew how

important cleanliness was, and he kept insisting on it. He even went out to the farms and showed dairymen how to care for their cows and the milk they produced. Some of his suggestions later were incorporated into a "Dairyman's Ten Commandments." These formed the basis of regulations required by many health departments.

As soon as the condensed milk factory started making money regularly, Gail began plans for expansion. He wanted a better, larger plant located in the heart of the milk producing country. In the autumn of 1860 he found the place he was looking for. It was at Wassaic in New York State's beautiful Harlem Valley. Large herds of cattle grazed on the fine pastures. A railroad ran nearby to take the condensed milk to the cities. Carpenters were building the new plant at Wassaic when Fort Sumter was fired on April 12, 1861, and the war between the states began. Gail rushed work on the plant; he got into production by June. Milbank took an active interest in the new enterprise. He bought out Bridges and Green, who still had large holdings in the condensed milk company.

Gail was in his 60's, but he didn't spare himself during the war years. He built a plant at Winsted, Connecticut, another at Brewster, New York, a third at Elgin, Illinois. Before the war was over union soldiers were carrying Borden's Eagle Brand Condensed Milk in their field rations. Nearly everyone who tasted it liked it. It became a highly-prized food. The army used all the milk Gail could supply; the public wanted it too; demand ran far ahead of production; Gail's fortune was made.

Gail was glad to ease up a little after the Civil War ended in 1865. More and more he turned the operations of the company over to his sons John and Henry Lee; more and more he thought of his younger

days in Texas; more and more he talked of his old friends, Austin, Houston and all the others who helped him make history. Gail was getting old, and he knew it. His health was failing. He wanted to go home; he wanted to spend the rest of his life in Texas.

But idleness wasn't in him. He had to be doing something. The great disappointment of his life was the meat biscuit, and now in his last years he decided to go back into the meat business. In 1872 he built a small meat preserving factory along Harvey's Creek a few miles from his daughter's home in Columbus, Texas, and put his son Henry Lee in charge. The little town that grew up around the plant was called Borden, Texas. Nearby he built a home for himself, another for Henry Lee. Gail's youngest brother, John, put up a house just across the creek.

Gail lived in Borden, Texas, until his death January 11, 1874, at the age of 72. His last years were happy. His children were with him. He was in the land he loved. He had often returned to Texas a failure. This time he was back home a success . . . a great success.

THE COMPANY HE FOUNDED

The story of Gail Borden is unusual in many ways, yet it has much in common with the stories of other leaders who helped build this country. Gail was one of a generation of daring men who founded many of the nation's great, productive businesses. With little money and much initiative he went to work. He put to good use the

opportunities America offers, and in doing this he made important contributions to his country and its economy. Failure did not discourage him. Success finally came, and it grew with the years.

Texas recognizes him today as one of her most successful sons. The company he established carries on his work and is a leader in the food industry. But in developing condensed milk Gail did more than found a company. He started the modern dairy industry, being the first to use large-scale processing of milk.

In Gail Borden's day milk was mostly a child's food. People used only a small portion of the dairy products they needed for good health. The three principal dairy foods—milk, butter and cheese—generally were sold a few miles from where they were produced.

Gail Borden's discovery widened markets for dairy products, built public confidence in them. Today milk is recognized as the most nearly perfect of all foods. It is used in many forms and large amounts by children and adults alike. Dairy products supply a major portion of the food for the average American diet. They are shipped from rich dairying areas to every part of the world.

Appropriately, the company Gail Borden began has had a leading role in these changes. It expanded his educational work with farmers. It developed rigid quality controls for every product. It made important contributions to research.

Through the years the company has grown. The partnership of two has become a partnership of 50,000 who now share in the ownership of the business. The employee group has grown from the handful who worked in the first tiny factory to the 28,000 men and women now in Borden plants and offices.

New products were added year after year, and as it branched out

the organization changed its name to The Borden Company. After condensed milk came fresh milk, evaporated milk, caramels, followed by ice cream, cheese, milk powders and other dairy foods, as well as casein and the scores of products made from it.

Then came the non-milk projects: animal and poultry feeds, grocery products, mince meat, coffee, pharmaceuticals, vitamins, soy bean products and many others.

The list will continue to grow as the company, moving ahead in the spirit that produced condensed milk, develops new products and investigates new lines.

